IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

IN RE: MARUTIAN, et al.	)
	) **APPEAL NO. _____**
SERIAL NO: 10/500,350	)
	)
FOR: METHOD OF APPLYING THE COATINGS FROM ALUMINUM ALLOY ON CAST IRON AND STEEL PRODUCTS	)
	) **BRIEF ON APPEAL**
FILED: February 9, 2005	)
	)
GROUP ART UNIT: 1792	)

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WENDY K. MARSH

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I. INTRODUCTION

This is an Appeal of the Final Rejection dated June 12, 2008, finally rejecting claims 1-5. The appealed claims 1-3 and 5 are set forth in an attached Appendix.

II. REAL PARTY IN INTEREST

The inventors of the invention of this application, namely Sergey Vasilievich Marutian and Yurily Sergeevich Volkov, are the real parties in interest in this case.

III. RELATED APPEALS AND INTERFERENCES

None.

IV. STATUS OF CLAIMS

Claim 1 was originally submitted in the U.S. national phase application dated February 9, 2005. In a response dated December 12, 2006, Appellants amended claim 1. In an amendment after final rejection dated August 16, 2007, Appellants amended claim 1 and added claims 2-5. In an advisory action dated August 22, 2007, the Examiner refused entry of the amendment after final rejection into the record.

In a response dated September 11, 2007, Appellants filed a Request for Continued Examination (RCE), amended claim 1 and amended claims 2-5. In a response dated April 14, 2008, Appellant amended claims 1-5.

In response to the final rejection dated June 12, 2008, Appellants filed a timely notice of appeal and pre-appeal brief request for review on August 19, 2008. In a decision dated September 11, 2008, Appellants' pre-appeal request for review was denied by the panel. The claims here appealed are claims 1-3 and 5, as set forth in an attached Appendix.

V. STATUS OF AMENDMENTS

No amendments were filed in Response to the Final Rejection dated June 12, 2008. As noted, a Notice of Appeal was timely filed on August 19, 2008.

VI. SUMMARY OF CLAIMED SUBJECT MATTER

A. Claim 1

Claim 1 relates to a method of applying aluminum alloy coatings on cast iron and steel product that first comprises product surface preparing. (Published application, paragraph 6, lines 1-3). The product is then plunged into an aluminum melt alloyed with zinc and silicon. (Pub. App, para. 6, lines 3-4). The product surface preparing includes jet-abrasive preparing (Pub. App. 6, lines 5-6) and alloying the aluminum melt with 7.0-10.0 % zinc, 3.0-5.0% silicon, 0.5-1.5% magnesium, and 0.2-0.5% tin. (Pub. App., para. 6, lines 6-14). The temperature of the melt is in the range of 660-680°C. (Pub. App., para. 7, lines 1-2). The aluminum coatings are applied on the products without flux or preheating to within austenitic temperatures prior to the plunging step. (Pub. App., para. 4, lines 1-7). The aluminum coatings achieve a Mandrel test of 10 mm, whereby the Mandrel test uses a mandrel having a minimum diameter of 10 mm. (Pub. App., para. 14, Table 2).

B. Claim 2

Claim 2 relates to a method of applying aluminum alloy coatings on cast iron and steel product that first comprises product surface preparing. (Published application, paragraph 6, lines 1-3). The product is then plunged into an aluminum melt alloyed with zinc and silicon. (Pub. App, para. 6, lines 3-4). The product surface preparing includes jet-abrasive preparing (Pub. App. 6, lines 5-6) and alloying the aluminum melt with 7.0-10.0 % zinc, 3.0-5.0% silicon, 0.5-1.5% magnesium, and 0.2-0.5% tin. (Pub. App., para. 6, lines 6-14). The temperature of the melt is in the range of 660-680°C. (Pub. App., para. 7, lines 1-2). The aluminum coatings are applied on the products without flux or preheating to within austenitic temperatures prior to the plunging step. (Pub. App., para. 4, lines 1-7). Claim 2 further provides that the aluminum coatings are further applied without the presence of copper in the melt. (Pub. App., para. 6, lines 6-14). The aluminum coatings achieve a Mandrel test of 10 mm, whereby the Mandrel test uses a mandrel having a minimum diameter of 10 mm. (Pub. App., para. 14, Table 2).

C. Claim 3

Claim 3 relates to a method of applying aluminum alloy coatings on cast iron and steel product that first comprises product surface preparing. (Published application, paragraph 6, lines 1-3). The product is then plunged into an aluminum melt alloyed with zinc and silicon. (Pub. App, para. 6, lines 3-4). The product surface preparing includes jet-abrasive preparing (Pub. App. 6, lines 5-6) and alloying the aluminum melt with 7.0-10.0 % zinc, 3.0-5.0% silicon, 0.5-1.5% magnesium, and 0.2-0.5% tin. (Pub. App., para. 6, lines 6-14). The temperature of the melt is in the range of 660-680°C for a period of 2 minutes or less. (Pub. App., para. 7, lines 1-2 and para. 13, Table 1). The aluminum coatings are applied on the products without flux. (Pub. App., para. 4, lines 1-7). The aluminum coatings achieve a Mandrel test of 10 mm, whereby the Mandrel test uses a mandrel having a minimum diameter of 10 mm. (Pub. App., para. 14, Table 2).

D. Claim 5

Claim 5 relates to a method of applying aluminum alloy coatings on cast iron and steel product that first comprises product surface preparing. (Published application, paragraph 6, lines 1-3). The product is then plunged into an aluminum melt alloyed with zinc and silicon. (Pub. App, para. 6, lines 3-4). The product surface preparing includes jet-abrasive preparing (Pub. App. 6, lines 5-6) and alloying the aluminum melt with 7.0-10.0 % zinc, 3.0-5.0% silicon, 0.5-1.5% magnesium, and 0.2-0.5% tin. (Pub. App., para. 6, lines 6-14). The temperature of the melt is in the range of 660-680°C. (Pub. App., para. 7, lines 1-2). The plasticity of the aluminum alloy coating is such that the coating passes up to a 10 mm mandrel test. (Pub. App., para. 14, Table 2). The aluminum coatings are applied on the products without flux or preheating to within austenitic temperatures prior to the plunging step. (Pub. App., para. 4, lines 1-7). The aluminum coatings achieve a Mandrel test of 10 mm, whereby the Mandrel test uses a mandrel having a minimum diameter of 10 mm. (Pub. App., para. 14, Table 2).

No means plus function or set plus function elements are identified in the claim on appeal.

VII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Claims 1-3 and 5 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

B. Claims 1-3 and 5 stand rejected under 35 U.S.C. § 112, first paragraph, as filing to comply with the enablement requirement.

C. Claims 1-3 and 5 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

D. Claims 1-3 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Rallis (U.S. Pat. No. 4,655,852) in view of Japan '213 (Japan 50-005213).

E. Claims 1-3 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gierek et al. (U.S. Pat. No. 4,070,210) in view of Rallis and Japan '213. (6/22/08 Action, p. 18).

VIII. ARGUMENT

A. Rejection Under 35 U.S.C. § 112, First Paragraph, Written Description

Claims 1-3 and 5 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. This rejection should be withdrawn.

1. The Law of Written Description

The predecessor to the Federal Circuit noted that, "A description as filed is presumed to be adequate, unless or until sufficient evidence or reasoning to the contrary has been presented by the examiner to rebut the presumption." In re Marzocchi, 439 F.2d 220, 224 (CCPA 1971)(Emphasis supplied). The Examiner, therefore, must have a reasonable basis to challenge the adequacy of the written description. Id. The Examiner has the initial burden of presenting by a preponderance of the evidence why a person skilled in the art would not recognize in Applicants' disclosure a description of the invention defined by the claims. In re

Wertheim, 541 F.2d 257, 262 (CCPA 1976). In rejecting a claim, the Examiner must set forth express findings of fact regarding the above analysis which support the lack of written description conclusion. Id.

The inquiry into whether the description requirement of 35 U.S.C. § 112, first paragraph is met is a question of fact. *In re Wertheim*, 541, F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976). Whether the description is adequate to support a later claimed invention depends on whether the disclosure of the application originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter. Lack of literal support, in and of itself, is not sufficient to establish lack of adequate descriptive support. *In re Kaslow,* 707 F.2d 1366, 1373, 217 USPQ 1089, 1096 (Fed. Cir. 1983). The description requirement of the first paragraph of 35 U.S.C. § 112 may be satisfied if there is support in the original disclosure for the concept of what is later claimed. *In re Anderson*, 471 F.2d 1237, 1244, 176 USPQ 331, 336 (CCPA 1973).

2. The Addition to the Claims of Inherent Features of Appellants' Process Does Not Constitute New Matter

The Examiner first states there is no support for excluding the preheating step in claims 1-2 (6/12/08 Action, p. 2). However, referring to the published application, ¶ 4 notes that, "[t]he disadvantage of the closest analog is impossibility of aluminum melt applying on cast iron and steel products at the temperature lower than 715°C without using fluxes and the presence of intermetallic compounds of quite a big thickness (10-15 micrometers) making the coating brittle, which doesn't allow to deform the steel product with aluminum coating hereinafter." The Summary of the Invention then notes that the present invention, "solves the problem of decreasing the temperature of aluminum melt,..." Thus, the disclosure specifically states that it solves the problem in the art of applying aluminum melt at high temperatures by decreasing the temperature of the aluminum melt. Such resolution of the

problem in the art therefore cannot occur by including a preheating step. Hence, the specification adequately supports this provision in claim 1, and meets the written description requirement of 35 U.S.C. § 112, first paragraph.

In this case, it is respectfully submitted that the Examiner has not met the initial burden of presenting evidence as to why a person skilled in the art would not recognize in Appellants' disclosure that its process is performed without preheating. Instead, the Examiner cited MPEP 2173.05(i) for its discussion that the mere absence of a positive recitation is not basis for an exclusion. The Examiner then notes that, "there is simply no discussion one way or the other as to preheating features." (6/12/08 Office Action, p. 3). It is simply not the case, however, that Appellants are simply silent as to this feature of the method. On the contrary, as noted above, Appellants specifically distinguish their invention on this basis. Therefore, the Examiner's rejection in this respect should be reversed.

The Examiner next states that "introduction of copper to the melt" in claim 2, last line is not supported by the disclosure as originally filed. (6/12/08 Action, p. 5). In this case, the concept that Appellants' process does not involve introduction of copper into the melt is reasonably conveyed from the specification as originally filed. In this regard, Appellants specifically describe in the Summary of the Invention that their method of applying aluminum coatings on cast iron and steel products comprises, "plunging the product into the aluminum melt alloyed with zinc and silicon the solution of said problem is reached by jet-abrasive preparing of the product and the aluminum melt is alloyed with zinc, silicon, magnesium, tin..." (Para. 6). Further, all of the preferred embodiments of Appellants' described invention disclose only the use of these elements. Nowhere does the disclosure suggest or describe the use of other elements besides zinc, silicon, magnesium, and tin as alloys. Certainly, the disclosure does not suggest to persons skilled in the art that copper is a suitable alloy for use in the invention. For these reasons, the original disclosure supports the added claim language which states that the process does not involve introduction of copper into the melt and meets the legal requirements of 35 U.S.C. § 112, first paragraph.

Next, the Examiner states there is no support for the language in claim 3, line 9 which provides that said plunging in aluminum melts is "for a period of less than 5 minutes." (6/12/08 Office Action, p. 8). In the response dated 4/22/08, Appellants amended claim 3 to describe that said plunging occurs for a time period of 2 minutes or less. This time period is literally supported by Tables 1 and 2 which describe time periods from 2 minutes (120 seconds) and less. Thus, the Examiner's rejection on this basis should also be reversed.

B. Rejection Under 35 U.S.C. § 112, First Paragraph, Enablement

Claims 1-3 and 5 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. This rejection should also be withdrawn.

1. The Law of Enablement

Enablement is a legal determination of whether a patent enables one skilled in the art to make and use the claimed invention. *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 960 (Fed. Cir. 1983), and is not precluded even if some experimentation is necessary, although the amount of experimentation needed must not be unduly extensive. *Atlas Powder Co. v. E.I. Du Pont De Nemours & Co.*, 750 F.2d 1569, 1576 (Fed. Cir. 1984); *W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 1556 (Fed. Cir. 1983). Nothing more than objective enablement is required, and therefore it is irrelevant whether this teaching is provided through broad terminology of illustrative examples. *In re Marzocchi*, 439 F.2d 220, 223 (CCPA 1971).

An analysis of whether the claims are supported by an enabling disclosure requires a determination of whether that disclosure contains sufficient information regarding the subject matter of the appealed claims as to enable one skilled in the pertinent art to make and use the claimed invention. In order to establish a prima facie case of lack of enablement, the Examiner has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. *See In re Wright*, 999 F.2d 1557, 1561-62 (Fed. Cir. 1993).

The threshold step in resolving this issue is to determine whether the examiner has met his burden of proof by advancing acceptable reasoning inconsistent with enablement. "Factors to be considered by the examiner in determining whether a disclosure would require undue experimentation have been summarized in *Ex parte Forman*, 230 USPQ 546, 547 (Bd. Pat. App. & Int. 1986); *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

2. The Examiner has Failed to Prove that it Would Take an Undue Amount of Experimentation to Practice the Claimed Invention

Claims 1-3 and 5 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. In this regard, the Examiner states that there is insufficient description "of how the 'Mandrel test' works such that this test can be reproduced, understood or compared, and thus one of ordinary skill in the art would not be able to make and/or use the invention." (6/22/08 Action, p. 9).

In the response dated April 22, 2008, claims 1-5 were amended to specifically note that the Mandrel test employed uses a mandrel having a minimum diameter of 10 mm, as set forth on page 3 of the specification. A simple Google search on the Internet demonstrates that the Mandrel test is a commonly known test in the industry for, "the test for determining the flexibility and adhesion of surface coatings by bending coated metal panels around mandrels." (See e.g. definition of "Mandrel test" on "composite.about.com", attached as Exhibit 1) The standard for enablement does not require Appellants to explicitly describe terms that are well known in the art, such as "Mandrel test." See e.g. MPEP Section 2164.04. Moreover, in order to make a rejection, the initial burden is on the Examiner to establish a reasonable basis to question the enablement provided for the claimed invention. *In re Wright*, 999 F.2d 1557, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993).

In this case, it is clear that "Mandrel test" is a term that is well known in the art. On this basis, it would certainly not require an undue amount of experimentation for a person skilled in the art to make and/or use of the Mandrel test set forth in the claims.

The Patent and Trademark Office Board of Appeals stated:

> The test [for enablement] is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed to enable the determination of how to practice a desired embodiment of the invention claimed.

Ex parte Jackson, 217 USPQ 804, 807 (1982).

It is respectfully submitted that, upon reading Appellants' disclosure, and based upon the Mandrel test is widely known and widely used in the art, those of ordinary skill in the art would have been provided a reasonable amount of guidance to make and use the claimed invention. The Examiner's rejection of claims 1-3 and 5 for lack of enablement should therefore reversed.

C. Rejection Under 35 U.S.C. § 112, Second Paragraph

Claims 1-3 and 5 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite. First, in the 6/22/08 Action, p. 11, the Examiner stated that in claim 1, "or preheating to within austenitic temperatures" is confusing as to what is required. In the 4/22/08 response, Appellants amended claim 1 to specify that the coatings are applied on the cast iron and steel products without preheating prior to the plunging step. It is only during the plunging step that the temperature of the melt is in the range of 660-680°C. This specifying statement is therefore not inconsistent with the remainder of the claim and is sufficiently definite under 35 U.S.C. § 112, second paragraph.

Second, the Examiner objected to the language pertaining to the Mandrel test in claim 1. (6/22/08 Action, p. 12). Again, the claims were amended such that it is believed the reference to the Mandrel test is sufficiently clear, especially to persons skilled in the art that are already familiar with the Mandrel test as to do so would be redundant and not legally required by § 112, second paragraph.

Finally, in claim 4, the Examiner states that "or preheating the product prior to plunging in the melt" is confusing as to what is required. (6/22/08 Action, p. 13). It is not understood what is confusing about this statement. In this regard, the claim simply states that the product is not preheated prior to plunging in the melt. That is unambiguous, and would not allow for heating prior to the coating step. The language itself disallows the options raised by the Examiner in the rejection, and is therefore sufficiently clear under 35 U.S.C. § 112, second paragraph.

D. Rejection Under 35 U.S.C. § 103(a), Obviousness over Rallis (U.S. Patent No. 4,655,852) in View of Japan '213 (Japan 50-005213)

Claims 1-2 and 5 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rallis in view of Japan '213. This rejection should be withdrawn.

1. The Law of Obviousness

The U.S. Supreme Court recently held that rigid and mandatory application of the "teaching-suggestion-motivation," or TSM, test is incompatible with its precedents. *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). The Court did not, however, discard the TSM test completely; it noted that its precedents show that an invention "composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *Id. See also Ex parte Whalen*, Appeal No. 2007-4423, p. 15).

The Court held that the TSM test must be applied flexibly, and take into account a number of factors "in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed." *Id.* at 1740-41. Despite this flexibility, however, the Court stated that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements in

the way the claimed new invention does." *Id.* "To facilitate review, this analysis should be explicit." *Id.*

The obviousness rationale addressed in *KSR* was premised on combining elements known in the prior art. *Id.* at 1738-39. A parallel analysis applies, however, to a rejection premised on the obviousness of modifying a known composition to change its properties. *Ex parte Whalen*, Appeal No. 2007-4423, p. 16).

The *KSR* Court noted that obviousness cannot be proven merely by showing that the elements of a claimed device were known in the prior art; it must be shown that those of ordinary skill in the art would have had some "apparent reason to combine the known elements in the fashion claimed." *Id.* at 1741.

In the same way, when the prior art teaches away from the claimed solution as presented here, obviousness cannot be proven merely by showing that a known composition could have been modified by routine experimentation or solely on the expectation of success; it must be shown that those of ordinary skill in the art would have had some apparent reason to modify the known composition in a way that would result in the claimed composition. *Ex parte Whalen*, Appeal No. 2007-4423, p. 16).

2. The Cited Prior Art Does Not Teach or Suggest Methods Having the Claimed Steps of the Present Invention, and Therefore Do Not Render the Claimed Invention Obvious

The combination of Rallis and Japan '213 fail to teach or suggest the provisions of the claimed invention, as Rallis requires preheating prior to the plunging step to a temperature above 1341°F to within the austenitizing temperature range of the carbon or alloy steel. (Col. 2, lines 18-21). Such preheating is disallowed by all of the claims. Japan '213 fails to provide this missing teaching as it does not disclose any process, but only an aluminum alloy.

It is the Examiner's position that, "it would have been obvious to perform the coating method of Rallis in view of '213 without preheating" on the basis that, "it has been held that omission of an element and its function in a combination where the remaining elements perform the

same functions as before involves only routine skill in the art," citing *In re Karlson*, 136 USPQ 184 in support. (6/22/08 Action, p. 17). While there is some support in the case law for the principle that omission of an element and its function involves only routine skill in the art, the court has also recognized that this is not a mechanical rule, and that the language in *Karlson* was not intended to short circuit the determination of obviousness mandated by 35 U.S.C. § 103 (*see In re Wright*, 343 F.2d 761, 769-70, 145 USPQ 182, 190 (CCPA 1965)). Further, Appellants direct the Examiner's attention to *In re Ochiai,* 71 F.3d 1565, 1570, 37 USPQ2d 1127, 1132 (Fed. Cir. 1995) and *In re Brouwer,* 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1996) wherein the Federal Circuit held that the claimed invention as a whole must be evaluated under the standards set down in *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 , 148 USPQ 459, 466 (1966) and its progeny, and that the use of *per se* rules is improper in applying the test for obviousness under 35 U.S.C. § 103 since such rules are inconsistent with the fact-specific analysis of claims and prior art mandated by Section 103.

Here, the Examiner has failed to meet the initial burden of proof for obviousness by failing to provide a reasonable suggestion for eliminating the preheating step of Rallis. In fact, Rallis teaches away from such elimination by virtue of its disclosure that said heat treatment is necessary in order to increase the yield strength of the steel article to a minimum of 60,000 psi. (Abstract). Thus, the Examiner has failed to provide a prima facie case of obviousness.

E. Rejection Under 35 U.S.C. § 103(a), Obviousness over Gierek et al. (U.S. Patent No. 4,070,210) in View of Rallis (U.S. Patent No. 4,655,852) and Japan '213 (Japan 50-005213)

Claims 1-3 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gierek et al. in view of Rallis and Japan '213. (6/22/08 Action, p. 18). This rejection should also be withdrawn.

Gierek does not disclose alloying of an aluminum melt with zinc, silicon, magnesium and tin. Rather, Gierek discloses an aluminum alloy that can contain aluminum and a single alloying metal such as zinc, silicon, magnesium or tin. More particularly, Gierek is limited to

a single alloying metal. There is no teaching or suggestion to modify the teachings of Gierek to alloy an aluminum melt with these four claimed metals. Further, it is again noted that Rallis in view of Japan '213 do not teach the preparation of aluminum allow on cast iron and steel products without preheating prior the plunging step to a temperature within the austenitizing temperature range of the carbon or alloy steel. Gierek also teaches preheating within the austenitizing temperature range, with upper bounds 270°C higher than the upper temperature allowed by the present invention.

The Examiner argues that where claimed ranges overlap or lie inside ranges disclosed by the prior art, a prima facie case of obviousness exists. (6/22/08 Action, p. 19). Again, however, the law of obviousness does not support such an automatic rule. While optimization of a known result-effective variable in a given range is generally obvious, *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955), it is only when it is reasonably expected that an improvement will arise in that range. See e.g. *Ex parte Atkinson*, Appeal 2007-3900 (December 18, 2007). Here, it is not clear what result the Examiner thinks would be "optimized" by substantially lowering the temperatures described by Gierek to below austenitizing range to arrive at Appellants' claimed preheating temperature range. For this reason, the Examiner has not met the initial burden for establishing a prima facie case of obviousness.

With respect to the lack of copper in the claimed invention, the Examiner asserts that the statement in Japan '213 that a desirable aluminum alloy includes 0.5% copper is "a typographical error." (6/22/08 Action p. 25). The Examiner's reasoning is that p. 61, first column teaches 0-5% copper, which the Examiner argues means that no copper can be used in the alloy. Appellants would respectfully note that is more likely that 0-5% copper is more likely the typographical error, and is intended instead to read "0.5% copper." Thus, the Examiner's assertion that Japan '213 teaches an aluminum alloy without copper is in error, and the rejection should accordingly be reversed.

IX. CONCLUSION

For the above-stated reasons, it is submitted that the claims are in a condition for allowability. The decision of the Examiner, therefore, should be reversed and the case allowed.

Enclosed herein please find the Appeal Brief and required fee of $250.00. If this amount is not correct, please consider this a request to debit or credit Deposit Account No. 26-0084 accordingly.

Respectfully submitted,

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X. APPENDIX - CLAIMS

1. A method of applying aluminum alloy coatings on cast iron and steel products comprising product surface preparing and then plunging the product into an aluminum melt alloyed with zinc and silicon characterized by jet-abrasive preparing of the product and alloying the aluminum melt with zinc, silicon, magnesium, and tin in following mass percentage:

zinc 7.0-10.0

silicon 3.0-5.0

magnesium 0.5-1.5

tin 0.2-0.5,

while the temperature of the melt is in the range of 660-680°C such that the plunging results in application of the alloy to the product;

said product surface preparing including the jet-abrasive preparing;

whereby said aluminum coatings are applied on the cast iron and steel products without flux or preheating to within austenitic temperatures prior to the plunging step, said aluminum coatings further achieving a Mandrel test of 10 mm, whereby said Mandrel test uses a mandrel having a minimum diameter of 10 mm.

2. A method of applying aluminum alloy coatings on cast iron and steel products comprising product surface preparing and then plunging the product into an aluminum melt alloyed with zinc and silicon characterized by jet-abrasive preparing of the product and alloying the aluminum melt with zinc, silicon, magnesium, and tin in following mass percentage:

zinc 7.0-10.0

silicon 3.0-5.0

magnesium 0.5-1.5

tin 0.2-0.5,

while the temperature of the melt is in the range of 660-680°C such that the plunging results in application of the alloy to the product;

said product surface preparing including the jet-abrasive preparing;

whereby said aluminum coatings are applied without flux or presence of copper in the melt or preheating to within austenitic temperatures prior to the plunging step, said aluminum coatings further achieving a Mandrel test of 10 mm, whereby said Mandrel test uses a mandrel having a minimum diameter of 10 mm.

3. A method of applying aluminum alloy coatings on cast iron and steel products comprising product surface preparing and then plunging the product into an aluminum melt alloyed with zinc and silicon characterized by jet-abrasive preparing of the product and alloying the aluminum melt with zinc, silicon, magnesium, and tin in following mass percentage:

zinc 7.0-10.0

silicon 3.0-5.0

magnesium 0.5-1.5

tin 0.2-0.5,

while the temperature of the melt is in the range of 660-680°C for a period of 2 minutes or less such that the plunging results in application of the alloy to the product;

said product surface preparing including the jet-abrasive preparing;

whereby said aluminum coatings are applied without flux;

and further providing that the aluminum coatings achieve a Mandrel test of 10 mm, whereby said Mandrel test uses a mandrel having a minimum diameter of 10 mm.

5. A method of applying aluminum alloy coatings on cast iron and steel products comprising product surface preparing and then plunging the product into an aluminum melt alloyed with zinc and silicon characterized by jet-abrasive preparing of the product and

alloying the aluminum melt with zinc, silicon, magnesium, and tin in following mass percentage:

zinc 7.0-10.0

silicon 3.0-5.0

magnesium 0.5-1.5

tin 0.2-0.5,

while the temperature of the melt is in the range of 660-680°C such that the plunging results in

application of the alloy to the product;

wherein the plasticity of the aluminum alloy coating is such that the coating passes up to a 10 mm mandrel test.

said product surface preparing including the jet-abrasive preparing;

whereby said aluminum coatings are applied without flux or preheating to within austenitic temperatures prior to the plunging step, and further providing that said aluminum coatings achieve a Mandrel test of 10 mm, whereby said Mandrel test uses a mandrel having a minimum diameter of 10 mm.

XI. EVIDENCE APPENDIX

None.

XII. RELATED PROCEEDINGS APPENDIX

None.